WHAT IS CLAIMED IS:

1. A system for non-invasively monitoring a blood constituent concentration in a living subject, said system comprising:

a light source which emits radiation at a plurality of wavelengths;

an active pulse inducement device which causes a periodic change in the volume of blood in the fleshy medium;

an optical detector positioned to detect light which has propagated through said fleshy medium, said optical detector configured to generate an output signal indicative of the intensity of said radiation after attenuation through said fleshy medium; and

a signal processor responsive to said output signal to analyze said output signal to extract portions of said signal due to optical characteristics of said blood to determine the concentration of said constituent within said subject's bloodstream.

2. The system of Claim 1, wherein the active pulse inducement device causes a periodic change in the volume of blood in the fleshy medium independent of the natural flow of blood in said fleshy medium.

3. The system of Claim 1, wherein the active pulse inducement device causes a periodic change in the volume of blood in the fleshy medium in conjunction with the natural flow of blood in said fleshy medium.

4. The system of Claim 1, further comprising a receptacle which receives said fleshy medium, said receptacle further having an inflatable bladder.

5. The system of Claim 1, further comprising a receptacle which receives said fleshy medium, said receptacle further comprising a temperature variation element, said temperature variation element cyclicly varying the temperature of said fleshy medium in order to induce a change in the flow of blood in said fleshy medium.

6. A system for non-invasively monitoring blood glucose concentration within a patient's bloodstream, said system comprising:

a light source which emits optical radiation at a plurality of frequencies;

a sensor configured to receive a fleshy medium of said patient, said fleshy medium having flowing blood;

a blood volume change inducement device which causes a cyclic change in the volume of blood in said fleshy medium;

an optical detector positioned to receive said optical radiation after transmission through a portion of said fleshy medium, said optical detector responsive to the detection of said optical radiation to generate an output signal indicative of the intensity of said optical radiation; and

a signal processor coupled to said detector and which receives said output signal, and which responds to said output signal to generate a value representative of the glucose concentration in the blood of the patient.

7. A method of non-invasively determining a concentration of a blood constituent comprising the steps of:

transmitting optical radiation through a medium having flowing blood, wherein the blood has a concentration of the blood constituent and the optical radiation traverses a path length through the medium;

actively influencing a periodic change in the volume of blood in said medium;

detecting the optical radiation after transmission through at least a portion of the medium;

generating a signal indicative of optical characteristics of the medium; and

Analyzing said signal to determine the concentration of said blood constituent.

8. The method as defined in Claim 7, wherein said step of actively influencing the volume of blood in said medium is independent of a natural flow of blood.

9. The method as defined in Claim 7, wherein said step of actively influencing the volume of blood in said medium is in conjunction with said natural flow of blood.

10. The method as defined in Claim 7, wherein the blood constituent comprises blood glucose.

11. A method of actively varying the attenuation of optical radiation due to blood in a fleshy medium comprising the steps of:

transmitting optical radiation through said fleshy medium;

actively inducing a periodic change in the volume of blood in said medium; and

detecting said optical radiation after attenuation through said fleshy medium and generating and output signal indicative of the intensity of the attenuated signal.

add A3

Add C1